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Risk Management and Value Creation

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ABSTRACT

Corporate failures, periodic recessions, regional debt crises and volatile financial markets have intensified the focus on risk management as the means to deal with turbulent conditions. The ability to respond effectively to abrupt environmental impacts is considered an important source of competitive advantage. Yet, surprisingly little research has analyzed whether the presumed advantages of effective risk management are associated with superior outcomes. Here we present a comprehensive study of risk management effectiveness and the relationship to corporate performance based on more than 33,500 observations in 3,400 firms over the turbulent 20-year period 1991-2010. Determining effective risk management as the ability to reduce earnings and cash flow volatility, we find that both have significant positive relationships to lagged performance measures after controlling for industry effects, company size and financial leverage.

KEY WORDS: Corporate risk management, Organizational slack, Strategic response capabilities

Enterprise risk management has become an executive mantra following the corporate scandals and financial crises in recent years. There is general awareness that the ability to deal effectively with major risks is important (e.g., Miller, 1998; Wang, Barney & Reuer, 2003). However, there is limited evidence on the proposed benefits from strategic risk management capabilities (e.g., Andersen, 2009; Smithson & Simkins, 2005) and what the drivers of effective risk management outcomes are (e.g., Beasley, Pagach & Warr, 2008; Liebenberg & Hoyt, 2003; Pagach & Warr, 2011). This begs for further empirical studies on the strategic advantages of risk management and the underlying drivers of potential effects. Hence, we investigate the relationship between effective risk handling and corporate value creation and analyze essential antecedents to effective risk management based on panel data from more than 3,400 firms representing more than 33,500 data points during the turbulent 20-year period 1991-2010.

THEORY AND HYPOTHESES

Strategic risk management rationale

Positive risk management outcomes are often ascribed to lower earnings and cash flow volatility that reduces the likelihood of liquidity shortfalls thus making funds available for good investments (Froot, Sharfstein & Stein, 1993). Earnings stability reduces bankruptcy risk and increases access to funding at more favorable rates. Effective risk management can help the firm access capital markets and find financial resources to implement strategic business plans (Nocco & Stultz, 2006). A reduced need for cash buffers may release funds for alternative business investments with higher returns (Merton, 2005). That is, value can be created from the ability to start profitable projects at lower funding costs. Lower bankruptcy risk may also reduce transaction costs from interactions with essential

stakeholders (Miller & Chen, 2003). This reasoning is consistent with the principles of firm valuation determined as the present value of future cash generation (C) minus bankruptcy costs: $VOF = PV[C - \text{bankruptcy costs}]$ (e.g., Stulz, 2003).

Investing in business projects should furnish strategic renewal and enable firms to adapt in view of strategic risks that change environmental conditions. Many risks are exogenous to the firm imposed by socio-economic conditions in the macro-environment that are beyond managerial control. This may include events that are identical under similar circumstances and thus allow prediction of probable outcomes as well as events that must be assessed without a valid basis for classification, which reflects the well known distinction between risk and uncertainty (Knight, 1921: 224). It may also relate to factors that are impossible to foresee in advance often referred to as ‘unknown unknowns’ (e.g., Loch et al., 2006). Strategic risks including competitor moves, technology shifts, changing industry paradigms, etc., are difficult to quantify because the implied effects are irregular and relate to unique structures and market positions of individual firms. Hence, the responses or dynamic capabilities required to deal effectively with these risks must be of firm-specific nature (Helfat et al., 2007; Teece, Pisano & Shuen, 1997; Zollo & Winter, 2002).

The dynamic capabilities have formally been described as “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Teece et al. 1997). They are formed by distinct skills, processes and procedures embedded in organization structure in ways that enable the firm to sense change, seize opportunities and reconfigure in the face of major changes (Teece, 2007). Like strategic responsiveness this requires an ability to assess environmental change and mobilize firm resources around investment in responsive actions that represent opportunities to adapt the firm to new challenges in the environment (Andersen, Denrell &

Bettis, 2007). Hence, we conceive of effective risk management (ERM) capabilities as the firm's ability to observe, react and adapt to major risk events so variation in corporate cash and earnings flows are reduced compared to industry peers.

H 1: *Firms that display effective risk management capabilities are associated with higher value creation*

Investing in opportunity development

The conventional risk management logic is focused on bankruptcy cost and access to favorable funding but is less concerned about how business propositions that can enhance responsiveness arise within the firm. This aspect takes a broader view on risk management as the ability to identify and develop opportunities that can both take advantage of upside potentials and fend off downside risks (e.g., Damodaran, 2008). Risk management capabilities can be partially ascribed to decentralized agents as they decide on local risk-return tradeoffs (Nocco & Stultz, 2006). This implies that opportunities can emerge from within the organization and intertwines with ideas about dynamic capabilities and strategic responsiveness as observing changes and developing opportunities that allow the firm to respond and adapt (Andersen et al., 2007; Teece et al., 1997; Teece, 2007). Since strategic risks often are hard to quantify and foresee their effective handling depends on the ability to sense major trends and construe alternative ways the firm can adopt as it proceeds. That is, responsiveness builds on an ability to innovate and apply new ideas, devices, systems, policies, programs, processes, products, services, and markets in ways that make operations more compliant with current conditions

(Damanpour, 1991; Nohria & Gulati, 1996; Scott & Bruce, 1994). These efforts can relate to product development, use of new technologies, new market entry, etc., but may also include changes in processes, administrative practices, management approaches, etc. (Damanpour & Evan, 1984). All of this represents development of opportunities accommodated by incremental resources that give leeway for local agents to act.

Availability of resources takes different forms and can be classified by the relative ease of access (e.g., Bourgeois & Singh, 1993). Some resources exist as excess remuneration for factor inputs and operating capacity, for example, indicated by the relative size of selling, general and administrative expenses. They can be recovered in internal budget reallocations and may absorb shocks so development projects can continue despite major disruptions (Cyert & March, 1963; Sharfman et al., 1988). They allow creative individuals with space and time to engage in collaborative development activities (Keegan & Turner, 2002). So, generic resources bound in the excess capacity of existing processes provide substantial discretion to reallocate resources for local purposes. Cash, e.g., indicated by the current ratio, is another form of resources that are immediately accessible whereas capital reserves, e.g., indicated by the debt-equity ratio, reflects the ability to access the financial markets through bank borrowing and new securities issues. While cash and capital reserves in principle are available for opportunity investment their deployment needs more formal approvals and thus leaves less discretion to reshuffle resources (George, 2005; Voss, Sirdeshmukh & Voss, 2008).

The relationship between resources available for opportunity investment and future performance is ambiguous (Cyert & March, 1963; Bromiley, 1991) but we propose an indirect risk management effect through the ability to develop opportunities that can be used in response to new conditions. We are particularly interested in the way available resources may enhance corporate adaptation in the face

of strategic risk events. This is consistent with the literature where, for example, Thomson (1967) recognizes that slack can allow the firm to take advantage of opportunities afforded by the environment in which it operates and that “firms with additional resources have more strategic options available” to them (Bromiley, 1991). The presence of resources arguably leads to a range of strategic options and alternative profit-yielding activities (Amit & Schumacker, 1993). Hence, there is a positive relationship between available resources and innovation (Nohria & Gulati, 1996), risk-taking (Singh, 1986), and adaptation (Kraatz & Zajac, 2001). Available resources can fund opportunity development with strong subunit support that otherwise might fail in a formal approval process (Cyert & March, 1963). New ideas, technologies and market offerings thrive on available resources as investment in development of opportunities that further enhance proactive choices and responsiveness.

H 2.1: *Effective risk management capabilities derive from the ability to invest in opportunity development*

However, too much resource availability can have adverse effects as it feeds complacency and ignorance among local agents and reduces responsive behaviors (Bansal, 2003; Yasai-Ardekani, 1986). It can also be argued that it reflects operational inefficiencies and sub-optimization (Singh, 1986). Since it essentially constitutes excess commitment of corporate resources beyond required optimal payments it may encourage shirking. In short, it may simply be a wasteful use of scarce resources with fringe benefits that let people act in self-interest (Jensen & Meckling, 1976). Excessive resource availability may induce risk aversion and less exploration (Mishina, Pollock & Porac, 2004; Jensen,

1986) but may also cause excessive risk taking (Singh, 1986) that lead to under-performing investments (Jensen, 1986, 1993).

H 2.2: *The positive relationship between the ability to investment in opportunity development and effective risk management capabilities is non-linear*

METHODOLOGY

Analyses

We perform regression analysis on annual panel data over the turbulent time period 1991-2010. The full dataset includes 3,432 firms with an average of 9.8 consecutive years available per firm making a total of 33,609 data points available for the regressions. This makes it the largest project scale of its kind to date with a potential to generate new insightful results. Regression on panel data that includes all firms with consecutive years of data reported also considers firms that left and entered the database during the period and thus eliminates possible selection biases that can be ascribed to many prior data analyses. The first hypothesized relationship was tested in regressions against annual performance measures as dependent variable and effective risk management measured from data during the prior five-years as the independent variable and treating the current performance year as the last observation. Control variables included observations for the same year as the dependent variable. The subsequent relationships were analyzed in regressions where the dependent and independent variables were determined over comparable five-year periods.

Data and measures

The data was extracted from Compustat for all firms across industries with annual performance reported some years during the twenty year period 1991 to 2010 but excluding financial sector entities (SIC: 6000-6999). The period was chosen because it covers a decade (1991-2000) of growth and global expansion for which a number of empirical studies exist, followed by a decade (2001-2010) of turbulence and two recessions considered suitable for a study of risk management effects. We excluded firm with sales below US\$100 million, which is defined as the limit for small-to-medium sized firms (SMEs).

Performance was measured as return on assets (ROA) and Tobin's q for the full year. ROA was calculated as annual net income divided by average assets over the period determined as the simple mean of assets at the beginning of the year and at yearend. Tobin's q was calculated as market value of equity divided by the book value of equity, which indicates how the market values the company in relation to the replacement cost of the firm's productive assets. The effective risk management (ERM) measure was conceived as the coefficient of variation in corporate sales divided by the volatility of corporate earnings (ROA) and cash flows (CFROI) over five-year periods. The variation in sales reflects influences of exogenous strategic risk factors including economic shocks and competitive moves whereas earnings and cash flow volatility indicate the firm's ability to dampen returns in the face of these exogenous effects during the same period. This ratio has been introduced as an indicator of risk management effectiveness (Andersen, 2009). We applied two measures for ERM, one based on annual performance expressed as ROA and another expressed as CFROI, where CFROI is determined as net cash flows for the year divided by total invested capital. This is consistent with measures

adopted in strategic management as proxies based on accounting returns including the standard deviations on ROE, ROA, ROI, etc. (e.g., Miller & Chen, 2003; Miller & Reuer, 1996).

The implied risk management capabilities reflect the firm's capacity to deal with major risk events including environmental hazards, financial turmoil, operational disruptions and strategic incidents like changes in competitive structure, technology shifts, new regulations, etc. The variability in realized returns, e.g., ROA, measures performance after the firm has responded to the exogenous risk events and thus captures the extent to which cash and earnings flows have been stabilized through effective risk management practices. Since net profit, and hence ROA, is influenced by developments in sales and costs, a high ERM measure reflects whether the firm has been able to adapt its costs to changes in sales. Statistical theory suggests that $\text{var}(\text{ROA}) \approx \text{var}(\text{Profits}) = \text{var}(\text{Sales}) + \text{var}(\text{Cost}) - 2 \cdot \text{cov}(\text{Sales}, \text{Cost})$. Hence, the standard deviation in profitability is effectively the outcome of the variance in sales (σ_R), the variance in costs (σ_C), and the co-variation ($\rho_{R,C}$) between sales and costs weighted by their relative size: $\sigma_P = [(\omega_R \sigma_R)^2 + (\omega_C \sigma_C)^2 - 2(\rho_{R,C} \omega_R \omega_C \sigma_R \sigma_C)]^{1/2}$. The minus enters the equation because cost is 'negative' (when costs go up, profits go down and vice versa). If sales and cost are approximately of equal size, the standard deviation of profitability is simplified to: $\sigma_P = [\sigma_R^2 + \sigma_C^2 - 2\rho_{R,C} \sigma_R \sigma_C]^{1/2}$. Hence, the more sales and costs co-vary ($\rho_{R,C} \approx 1$), the lower is the variance in profits. By extension, since returns derive from profits ($\text{ROA} = \text{Net income}/\text{Total assets}$), the variance in returns will be lower the more revenues and costs co-vary. So, we can interpret the adaptation process as the aggregate effect of many opportunities that support sales efforts in response to changes in market conditions while adapting internal processes in ways that accommodate these responses and retain economic efficiencies.

Effective risk management may be affected by a number of things including different resources available to innovate and search for responsive opportunities. These include excess expenses devoted to operational activities measured as sales, general, and administrative expenses divided by total sales (Miller & Leiblein, 1996; Reuer & Leiblein, 2000). They also include cash available for short-term resource commitments measured by the current ratio and calculated as current assets divided by current liabilities (Bourgeois & Singh, 1993). Finally, it includes available funding sources in the capital market indicated by the debt-to-equity ratio and calculated as total long-term debt divided by shareholders' equity consisting of paid-in capital and retained earnings (Bromiley, 1991; Bourgeois & Singh, 1993).

We consider a number of control variables. The performance regressions include industry performance measured as average performance of peers in the firm's industry defined by the two-digit SIC code to control for systematic differences in industry performance. Organizational size reflects prior success and may reflect slack resources that give the firm additional leeway to cope with external shocks and periods of adverse conditions. It was calculated here as the natural logarithm of total assets. Investment intensity reflects the level of funding committed to investment in new projects that might affect risk outcomes. It was calculated as total capital expenditures as a percentage of the firm's total assets. Autonomous investment indicates the leeway made available for incremental investment in new projects that might influence the firm's ability to respond and adapt to unexpected events. It was determined as the free cash flow as a percentage of total capital expenditures.

The measures of performance, effective risk management, SG&A, current and debt-equity ratios, investment intensity, and autonomous investment were standardized across two-digit SIC codes to eliminate industry specific effects.

RESULTS

The initial results from the full sample regressions analysis are reported in Table 1. We notice here that effective risk management (ERM) has a significant positive relationship to lagged performance measures of ROA based on two measures of ERM, one based on earnings volatility and another based on cash flow volatility, and after controlling for industry performance, company size and financial leverage. The same result prevails when Tobin's q is used as performance measure even though the sample size is somewhat smaller due to missing observations. These results are consistent with hypothesis 1. We conducted further analysis to test the robustness of results by excluding observations with performance below or above the mean value plus and minus three times the standard deviation. We also windsorized the data around three times the standard deviation. In either case the analytical results were not materially different from those reported here.

----- Please insert Table 1 about here -----

The results from the second regression analyzing the antecedents to effective risk management (ERM) are shown in Table 2. The results show that resources available in allocated sales, general and administrative expenses have a negative first order and positive second order relationship to ERM indicating that a certain level of discretionary resource availability is associated with effective risk management capabilities. We further find that available cash expressed in the current ratio has a negative first order and positive second order relationship to ERM indicating that cash availability is associated with effective risk management capabilities although with diminishing effect. Finally, we

find that the debt-equity ratio has a negative relationship to ERM indicating that access to resources in the capital market is positively associated with effective risk management capabilities. These initial findings are consistent with the premises for hypotheses 2.1 and 2.2.

----- Please insert Table 2 about here -----

These initial results seem to suggest that effective risk management capabilities relate to availability of resources to develop innovative opportunities that enable the firm to respond to the changing conditions of a competitive environment. The findings uncover the tensions between management control and corporate entrepreneurial perspectives as potentially competing risk management approaches. However, our current insights suggest that these are not either or considerations. There is a need for balanced solutions. Here we have access to a unique and comprehensive dataset that will allow us to refine and extend the preliminary analyses and extract further insights into the intriguing and important relationships between resource availability, corporate entrepreneurship, strategic risk management, performance and corporate longevity.

DISCUSSION & CONCLUSION

The preceding analysis suggests that potential strategic risk management effects relate to the ability to create new business opportunities as alternative strategic options constitute the means to enhance corporate maneuverability and responsiveness. Discretionary resources that give sufficient leeway to the innovative and entrepreneurial efforts of local agents may furnish development of new business opportunities in response to changing demands. Some availability of ready cash and capital

reserves make it possible to advance opportunity development and eventually launching promising business ventures when the market conditions call for it. Hence, effective risk management is facilitated by budget allocations that favor innovative initiatives and by available financial resources to extend and implement them. This reasoning is consistent with the conventional rationales for positive risk management effects but extends these perspectives with the potential of uncovering important managerial antecedents for effective risk management outcomes.

However, the empirical evidence informing these issues is scarce and inconclusive. One study found that high financial leverage makes the appointment of Chief Risk Officers (CROs) more likely and that firms with low capital reserves display poorer risk management outcomes (Liebenberg & Hoyt, 2003). This is not inconsistent with our results but may suggest that firms with high financial gearing try to improve risk management by appointing a CRO to economize on capital resources. A recent study found that volatile cash flows and stock prices are significant predictors for the appointment of CROs (Pagach & Warr, 2011). These results contravene the idea that resource availability is necessary to develop and implement responsive opportunities and hence a prerequisite for effective risk management capabilities. They point to contradictions between prescriptive theory and corporate risk management as commonly practiced. It appears timely to delve further into these issues that are so central to risk management.

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Table 1. Regression Results: Performance Effect of Effective Risk Management
[Coefficients (t-values)]

	Return on assets		Tobin's q	
Observations	32,313	25,712	21,095	17,645
Groups	3,378	2,879	2,625	2,330
[Coefficients (t-values)]	(roa) I	(cfroi) II	(roa) I	(cfroi) II
Intercept	-0.044** (-4.37)	-0.068*** (-5.75)	0.521*** (3.55)	0.441*** (2.61)
Effective risk management (ERM)	0.010*** (16.39)	0.004*** (4.74)	0.051*** (7.02)	0.037*** (5.31)
Industry performance	0.923*** (34.65)	0.933*** (30.49)	0.875*** (31.73)	0.886*** (29.92)
Firm size [ln(assets)]	0.007*** (4.78)	0.011*** (6.01)	-0.054*** (-2.56)	-0.046*** (-1.87)
Financial leverage (standardized)	-0.035*** (22.81)	-0.038*** (-21.31)	-0.139*** (-10.45)	-0.146*** (-10.25)
R-squared within	0.154	0.151	0.154	0.154
R-squared between	0.167	0.164	0.134	0.112
R-squared overall	0.171	0.167	0.139	0.120
F-significance	0.000	0.000	0.000	0.000

*** $p < 0.001$, ** $p < 0.01$

Table 2. Regression Results: Analyzing Risk Management Antecedents
[Coefficients]

	Effective Risk Management
Observations	4,112
Groups	694
Intercept	-0.733**
Sales, general & administrative cost ratio	-0.427***
(sales, general & administrative cost ratio)*2	0.118***
Current ratio	-0.032
(current ratio)*2	-0.040**
Debt-equity ratio	-0.194***
(debt-equity ratio)*2	0.003
Investment intensity	0.119**
Autonomous investment	0.132**
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R-squared within	0.035
R-squared between	0.044
R-squared overall	0.031
F-significance	0.000
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*** $p < 0.001$, ** $p < 0.01$	